REMARKS

Reconsideration of the application is respectfully requested for the following reasons:

1. Amendments to Specification and Claims

The specification has been amended to correct a typographic error.

Claim 1 has been amended to include the limitations of original claim 2.

New claim 6 combines the subject matter of original claims 1 and 3. New claims 7 and 8 correspond to original claims 4 and 5, but depend from new claims 6.

It is noted that new claim 6 recites perpendicularly arranged wires, rather than vertically arranged wires. The perpendicular arrangement of the wires is clearly apparent in Fig. 4, and therefore does not constitute new matter. Because the remaining changes to the specification and claims are all formal in nature, it is respectfully submitted that the changes also do not involve new matter.

2. Rejection of Claims 1, 4, and 5 Under 35 USC §103(a) in view of U.S. Patent Nos. 6,753,912 (Wayne) and 6,618,083 (Chen)

This rejection has been rendered moot by the incorporation, into independent claim 1, of the limitations of claim 2, and by the combination of claims 1 and 3 in independent claim 6.

3. Rejection of Claims 2 and 3 Under 35 USC §103(a) in view of U.S. Patent Nos. 6,753,912 (Wayne), 6,618,083 (Chen), and 6,437,341 (Izumi)

This rejection is respectfully traversed on the grounds that the Wayne, Chen, and Izumi patents, whether considered individually or in any reasonable combination, fail to disclose or suggest:

- an active pixel sensor having a separate voltage source for the reset transistor, as recited in original claim 1.

Furthermore, the Wayne, Chen, and Izumi patents fail to disclose or suggest an active pixel sensor having a separate voltage source for the reset transistor and in which the voltages to the pixel are supplied by:

- overlapped metal wires, as recited in amended claim 1, or
- two layers of perpendicularly arranged metal wires as recited in claim 6.

a. Arguments Concerning Original Claim 1 (Combination of Chen and Wayne)

With respect to original claim 1, while the Wayne patent teaches two voltage sources Vres and Vdd, there is no suggestion that the voltage sources should be different. On the other hand, the Chen patent uses a single voltage source rather than dual voltage sources, and as a result requires restricting the gate voltage of the reset transistor in order to suppress a mismatch effect of the reset transistor. This is not the same as using two voltage sources and, in fact, the result obtained by Chen is contrary both to the claimed invention and to the dual voltage source arrangement of Wayne. As a result, the proposed combination of the Wayne and Chen patents makes no sense and could not have been obvious.

Neither the Chen patent nor the Wayne patent teaches consider using two voltage sources that are both **separate** and **different**, as claimed. To the contrary, if Chen had considered using the separate voltage sources of Wayne, there would have been no need for the circuit taught by Chen. However, instead of providing separate voltage sources, Chen teaches that the mismatch effect caused by the non-ideal reset switch should be suppressed by restricting the gate voltage Vgh of the reset transistor RES to be greater than Vdd + (VT+delta(VT), where VT is the threshold voltage of the resent transistor and delta (VT) is the maximum variation of VT for a given process. This actually has the effect of ***increasing*** the noise in the photodiode because, since the gate voltage is larger than Vdd by more than VT+delta(VT), noise from voltage source Vdd will pass through the reset transistor RES directly to the photodiode. If Chen had considered using two voltage sources, this increase in noise could have been avoided.

According to the present invention, since the voltages VRT1 and VRT2 are supplied separately, the flexibility of voltage variation can be increased, in comparison with that achievable in the Chen circuit. For example, comparing the circuit of Chen with the circuit illustrated in Fig. 1 of the present application, by using separate voltage sources VRT1 and VRT 2, it is possible to raise the RESET pin voltage to greater than VRT1 but still be less than VRT1 + (VT+delta(VT), where VT corresponds to the threshold voltage of M1 and delta VT corresponds to the maximum variation of VT for process variation, without limitation resulting from the requirements of the other circuit elements, which are supplied by VRT2. The result is to prevent the noise of VRT1 from passing though M1 directly to the photodiode while maintaining the dynamic range of the pixel. This cannot be accomplished by Chen, and is not contemplated by Wayne. As a result, it is respectfully submitted that claim 1, ***as originally filed***, is not suggested by any reasonable combination of the Chen and Wayne patents.

b. Arguments Concerning Amended Claim 1 and New Claim 6 (Chen, Wayne, and Izumi)

The amendments to claim 1, and new claim 6, provided further distinctions. The use of overlapped metal wires as the voltage supply leads has the advantage of saving layout space, in addition to reducing noise interference, while the use of perpendicularly arranged wires has the further advantage of reducing parasitic capacitances between the wires. Neither arrangement is suggested by any of the applied references, whether considered individually or in any reasonable combination.

The Chen and Wayne patents do not disclose any specific wire arrangement, while the Izumi patent teaches using an opening 41 to reduce parasitic capacitances between a pixel electrode 31, and the electrode wires supplying gate electrode 2 and data electrode 3 and not connection two voltage sources to two layers of overlapped metal wires or two layers of perpendicularly arranged metal wires. To the contrary, **the Izumi patent only discloses the layout of the electrodes** 31, 2, and 3, **which is different than the layout of metal wires** (voltage sources) as disclosed in the present application.

Because the Izumi patent fails to disclose the claimed layouts of metal wires for supplying different voltages to a reset transistor and pixel read out circuit, it is respectfully submitted that the Izumi patent, in combination with the Chen and Wayne patents, could not have suggested the combination recited in original claims 2 and 3, now included in amended claim 1 and new claim 6, from which claims 2, 3, 7, and 8 depend. Withdrawal of the rejection under 35 USC §103(a) is therefore respectfully requested.

Having thus overcome each of the rejections made in the Official Action, withdrawal of the rejections and expedited passage of the application to issue is requested.

Respectfully submitted,

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